

National Weather Service  
Lincoln, Illinois

# Central Illinois Lincoln Logs



Volume 15, Issue 3

Fall 2012

## Inside this issue:

Dual Polarization Radar 1

Winter Weather Preparedness 3

Drought Update 4

2012 Heat Statistics 5

Edward H. Stoll Award 6

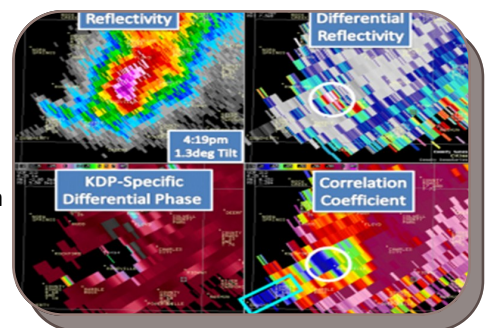
Cooperative Observer Program News 7

Winter Weather Outlook 10

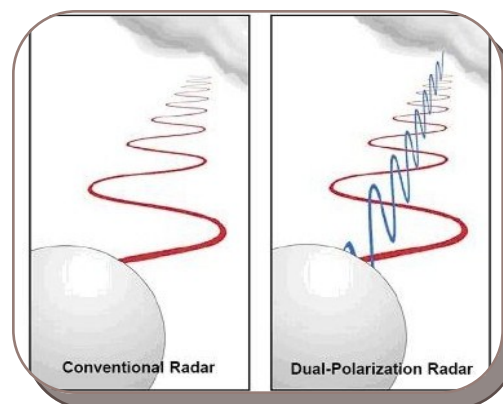
## Lincoln Radar Upgraded to Dual-Polarization in October

By: Dan Smith, Senior Meteorologist

The National Weather Service Office in Lincoln has just completed the Dual Polarization upgrade, which will give meteorologists a better overview of the atmosphere with respect to precipitation estimates, determining precipitation type, and rainfall estimation for flash flood forecasting just to name a few. Dual Pol will NOT improve tornado lead times or provide us with an exact precipitation type at ground level.



## Differences between Conventional and Dual-Polarization Radar:



Conventional Doppler radars transmit and receive pulses of radio waves in a horizontal orientation. As a result, the radar only measures the horizontal dimensions of targets (e.g. cloud and precipitation droplets). Dual-Polarization radar transmits and receives pulses in both a horizontal and vertical orientation. Therefore, the radar measures both the horizontal and vertical dimensions of targets. Since the radar receives energy from horizontal and vertical pulses, we can obtain better estimates of the size, shape, and variety of targets. It is expected that this will result

in improvements in the estimation of precipitation rates and the ability to discriminate between precipitation types (e.g. hail vs. rain, rain vs. snow).

## Dual Pol Products and Applications

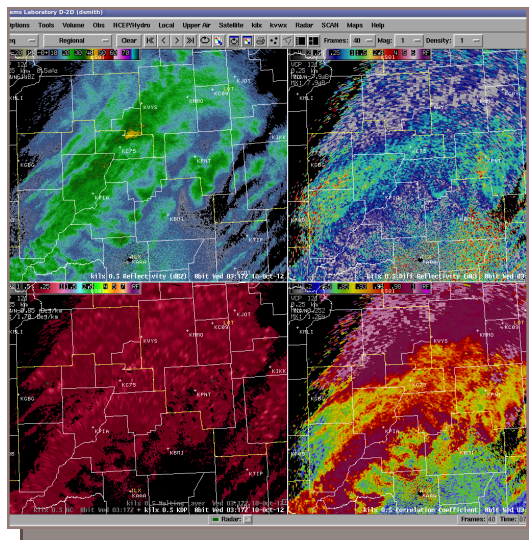
Meteorologists have been using the "standard" radar products such as Base Reflectivity and Base Velocity for years now, and that will not change with the upgrade to Dual Pol. All the "Legacy" products will remain with 14 new products added to the list. Now, forecasters can not only look at the Base Reflectivity and Base Velocity products, but with the Dual Pol upgrade can add other products that can be viewed side by side.

*(continued on page 2)*

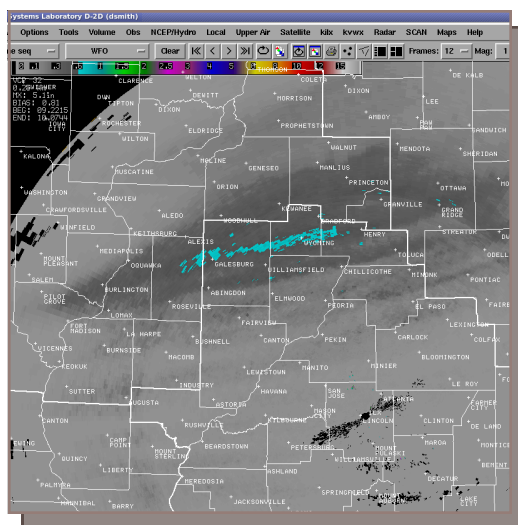
## Dual-Polarization Radar (cont.)

Some examples of new products from the dual-polarization radar:

- **Differential Reflectivity (ZDR)** will give meteorologists a better idea of drop size distribution in a hydrometeor. An area of low ZDR coincident with an area of high base reflectivity can indicate the potential for large hail.
- **Correlation Coefficient (CC)** gives us an idea on how similarly the horizontal and vertical pulses behave in a volume scan. When pulses behave similarly, we have high CC but when pulses behave differently, the result is a low CC. Used in conjunction with base reflectivity and differential reflectivity, it can help discriminate between rain, snow, hail, and non-meteorological targets (e.g. birds, insects).
- **Specific Differential Phase (KDP)** gives meteorologists an idea of the liquid water content. Simply put, the main advantage of KDP is its ability to determine areas of heavy rain, heavy rain mixed with hail and cold versus warm rain processes.



### Dual Pol Rainfall Estimates



One of the main benefits of the Dual Polarization upgrade will be with Flood and Flash Flood Warnings, which includes:

- Better estimation of total precipitation amounts.
- Better estimation of the size distribution of hydrometeors (raindrops, snowflakes, hailstones, drizzle.
- Much improved ability to identify areas of extremely heavy rainfall that are closely linked with flash floods.

The figure at left is a display of the Dual Pol Storm Total Product estimate showing a more significant band of rain had fallen from near Galesburg east to just west of Henry. With improved information about the size and shape of precipitation, forecasters can more accurately estimate the amount of rain reaching the ground and then identify areas of heavy rainfall. This information is expected to help forecasters issue more timely and accurate flood and flash flood warnings.

This much anticipated upgrade is part of the NWS vision to build a Weather Ready Nation to better protect lives. This new technology will result in 14 new radar products that will enable us to continue providing our suite of high quality products and services to the public. The new technology and data will primarily help forecasters identify the type of precipitation that is falling as well as improve rainfall estimates. These 14 new radar products with the Dual Pol upgrade are not replacing the "older" legacy radar products, but will be added to the product list to help forecasters better assess the environment. The full benefit of dual-pol radar, however, will not be fully realized until NWS forecasters develop real-time expertise with each of the products.

## Winter Weather is Around the Corner: Are You Prepared?

By: Chris Miller, Warning Coordination Meteorologist

The winter of 2011-12 was rather uneventful as far as winters go. Most locations in central and eastern Illinois ended up in the top five all time for least snowfall in a winter and warmest average temperatures in a winter. The only winter storms that occurred in the state were in far northern Illinois. Despite the mild winter conditions, however, the small amounts of ice and snow we received still resulted in numerous traffic accidents on Illinois roadways.

From late November into early March, when there was snow or ice on roads, a total of 20,018 accidents occurred in Illinois. There were 35 fatalities and 3,344 people injured due to these accidents. Now is the time to start thinking about winter driving practices and getting our vehicles prepared for ice, snow and sleet.

Some of the most important items to check on your vehicle are tires and brakes. Make sure you have sufficient tread and tire pressure to handle cold temperatures and icy, snow covered roads. Have your brakes checked by a reputable dealer or mechanic. Keep in mind that if your vehicle has anti-lock brakes (ABS), they are not designed to be “pumped” when you skid on a road. Keep even pressure on the brake pedal. You will feel and hear a vibration or rumbling in the brakes – but that is normal for ABS.

Don’t forget about having good windshield wipers so you can see where you are going! It is best to replace them prior to winter, especially after the hot, dry summer we just had. Also, check your windshield fluid frequently during the winter. Make sure your anti-freeze is tested and other fluid levels are at normal levels. Don’t forget to have an ice scraper and brush on hand. Many accidents occur because people don’t take the time to clear their windows.

A few other items to keep in your vehicle during the winter include a small shovel, a tow rope with loops (avoid chains and hooks if possible), booster cables, and a tool kit with a few of the basics. A sack of sand or cat litter is also useful in case you get stuck and need traction under your tires.

Now that your vehicle is prepared, ask yourself if you are prepared. If you are planning a day long trip during winter OR just a jaunt across town, ask yourself these questions: What if I become stranded or need to wait for a tow? Am I dressed properly for the conditions or do I have extra items to make that waiting time a bit more comfortable? During bigger storms, you could be stuck waiting for several hours. Having a winter survival kit in your vehicle is the place to start.

Take a plastic tote or box and include the following items: a blanket, extra socks & clothing, a flashlight with extra batteries, drinking water, first-aid kit, a large empty can with cover and tissues.

Having an extra pair of boots can be handy to keep your feet warmer and drier in case you leave home unprepared and you need to get out close to your vehicle into the snow or ice. If you have a cell phone, bring that along and make sure you have a way to recharge it in your vehicle.

Finally, when it comes to traveling during the winter remember the word “Extra”. Allow “extra” time to get where you are going and give yourself “extra” braking distance when stopping. Four-wheel drive is great for driving on rough roads, but does absolutely nothing for you when it comes to braking on the ice and snow. Just slow down – you will be delayed much longer if you get in an accident than if you reduce your speed several MPH in wintry conditions. The last, and definitely not the least, point is this: Check the weather forecast for your entire route when traveling. It may look sunny out the window at home, but conditions could be treacherous only a few miles away.

Using the time to prepare BEFORE winter weather arrives will make you less likely to become a “statistic”. After all, as Howard Ruff once said, “It wasn’t raining when Noah built the ark.”

Winter Weather Preparedness Week in Illinois is November 11 – 17, 2012. For more winter weather preparedness information, road reports and other winter related items go to:

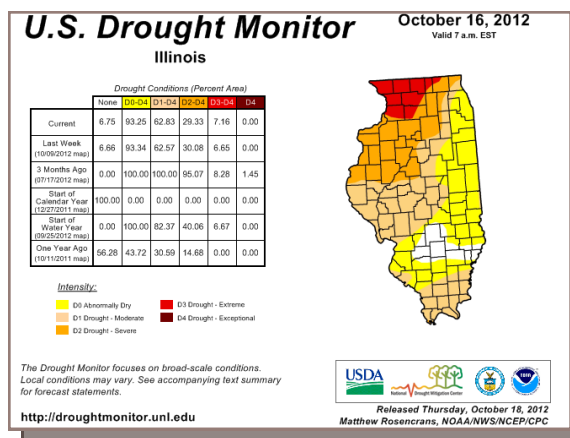
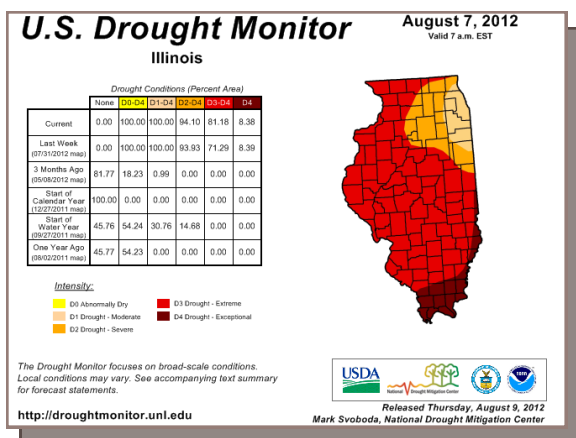
<http://www.crh.noaa.gov/ilx/?n=winter>

## Drought Easing but Impacts Still Being Felt

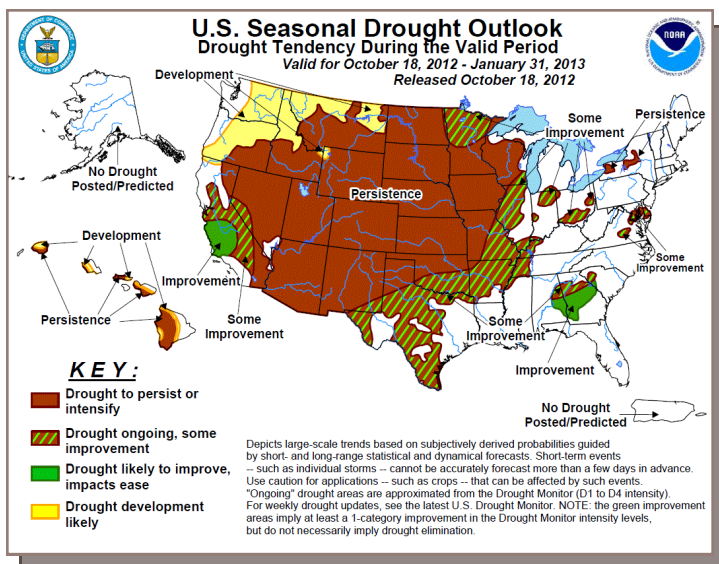
By: Chris Geelhart, Meteorologist

After extreme drought conditions spread over most of the state during the summer, some relief has been noted over the last few months.

In the left image below, valid on August 7, all of Illinois was classified as being in drought, with 81% of the state considered to be in extreme (red shade on map below) or exceptional (brown shade) drought. By October 16 (right image), only northwest Illinois was still considered to be in extreme drought, with drought conditions largely eased over eastern and south central Illinois.



Much of the relief began toward the end of August, when the remnants of Hurricane Isaac moved through the Midwest. Much of central and southeast Illinois received 3 to 5 inches of rain, with locally heavier totals. The highest total in our area, 5.93 inches, was reported at Taylorville; other excessive amounts included 5.74 inches at Flora (Clay County), 5.61 inches east of Thomasboro (Champaign County), 5.47 inches at Canton (Fulton County), 5.45 inches at Beecher City (Effingham County), 5.33 inches in Le Roy (McLean County), and 5.20 inches at Jacksonville (Morgan County). A wet September followed in east central and especially in southeast Illinois, where monthly totals in Clay County included 14.37 inches near Clay City, and 14.20 inches at Flora.



Despite the heavy rain, some drought concerns remain over portions of central Illinois. Areas from about Macomb to Morton northwest were still considered to be in severe drought conditions. Ground water levels were still recovering from the severe deficits earlier in the year. Water restrictions remain in place in Springfield and Decatur, as the levels of Lake Springfield and Lake Decatur remain significantly below normal.

Some continued easing of drought conditions is forecast for the next few months, per the seasonal drought outlook issued on October 18 and valid through the end of January.



## Heat Statistics for 2012

By: Chris Geelhart, Meteorologist

June and July went down as some of the hottest months in recent memory across central and southeast Illinois. The rapid acceleration of the drought helped produce an excessive number of 90- and 100-degree days across the region. In many cases, the summer of 1988 was the closest comparison to this year's heat and dry weather. However, due to the drought, humidity was generally not as much of a factor as normally occurs in Illinois summers.

Here are some heat-related statistics for area cities, through October 1.

Location	Total 90-degree days this year	Record number of 90-degree days in a year	Total 100-degree days this year	Record number of 100-degree days in a year	Hottest temperature this year
Charleston	65	80 days in 1933 and 1936	14	26 days in 1936	105 (6/29, 7/6)
Decatur	43	79 days in 1933	5	26 days in 1936	102 (7/6)
Jacksonville	57	82 days in 1936	10	36 days in 1936	105 (7/8)
Lincoln	46	77 days in 1936	6	26 days in 1936	102 (7/6, 7/7)
Normal	55	75 days in 1895 and 1901	12 (tied 5th most in a year)	22 days in 1936	107 (7/8)
Olney	67	94 days in 1936	15 (tied 4th most in a year)	39 days in 1936	105 (6/29, 7/6)
Peoria	50	69 days in 1887	8	23 days in 1936	104 (7/7, 7/23)
Springfield	63 (tied 4th most in a year)	70 days in 1936	11 (3rd most in a year)	29 days in 1936	104 (7/6, 7/7)
Urbana	55	56 days in 1936, 1954, and 1988	9 (3rd most in a year)	15 days in 1936	103 (7/6, 7/7)

## Summer Climate Statistics (June 1 through August 31)

### Peoria:

- Average temperature: 76.4°F (2.7°F above normal)
- Highest temperature: 104°F on July 7 and 23
- Total precipitation: 7.47" (3.15" below normal)

### Lincoln:

- Average temperature: 74°F (0.6°F above normal)
- Highest temperature: 102°F on July 6 and 7
- Total precipitation: 3.41" (9.89" below normal)
- 2nd driest summer on record

### Springfield:

- Average temperature: 77°F (2.8°F above normal)
- Highest temperature: 104°F on July 6 and 7
- Total precipitation: 4.22" (7.22" below normal)
- 4th driest summer on record

## Morrisonville Observer Receives Stoll Award

By: Emily Timte, Meteorologist Intern

On September 12, officials from the National Weather Service (NWS) office in Lincoln presented Dorothy Bullard of Morrisonville (Christian County) with the Edward H. Stoll Award during an appreciation luncheon in Morrisonville. This award is given to Cooperative Weather Observers completing 50 years of service. Mrs. Bullard has provided the NWS with weather data for over 18,000 days during that period.

NWS Lincoln Data Acquisition Program Manager Billy Ousley says, "Dorothy Bullard is truly a unique American who stands out among the 11,000 cooperative observers nationwide."

This award was created and became effective in 1975 in honor of Mr. Edward H. Stoll. Mr. Stoll was the observer at Elwood, Nebraska for over 76 years and was the first to receive the prestigious Stoll Award. The Edward H. Stoll Award is signed by the Assistant Administrator of Weather Services (Director of the NWS).

Mrs. Bullard and her husband Bill have also been recognized several other times for various awards. Among them is the John Campanius Holm Award, which is granted each year to a maximum of 25 cooperative observers for outstanding accomplishments in the field of cooperative observations. Mr. Holm was the first person known to have taken systematic weather observations in the American colonies in 1644 and 1645.

Additionally, Mrs. Bullard has also received the Thomas Jefferson Award, the highest and most prestigious award bestowed on Cooperative Weather Observers. That award is named for our nation's third President, who kept an almost unbroken series of weather records from 1776 to 1816. This award is given to very few observers each year, usually not more than five, for outstanding and unusual achievements. All candidates for the Jefferson Award must have received the Holm Award in the past and allow five years to pass before becoming eligible for the Jefferson Award.



## COOP Corner

By: Billy Ousley, Data Acquisition Program Manager, and Emily Timte, Meteorologist Intern

### Snow Observations:

With winter right around the corner, it's time to get your snow boards and snow sticks ready to go! A few reminders about snow reporting...

- For precipitation total, melt down whatever has fallen in the large outer tube, pour into inner tube, and measure (reported in hundredths). **\*\*Make sure that the inner tube and gage top has been removed beforehand, so the gage can catch the snow!!\*\***
- To report new snowfall, your primary method should be your snow board. However, if it was a high wind day and snow has drifted, take a few extra measurements around the yard to ensure that it is representative (reported in inches and tenths).
- Finally, you will need to report snow depth (both old and new snow) - take several measurements to determine an average depth (reported in whole inches).

### FPR (Recording Rain Gage) Downloads:

Please remember to download data to the flash drive after NOON on the first of the month. To do this, turn on the display, and then insert flash drive into USB port. The display will show a countdown until download is complete. Once finished (displays UFdC), remove flash drive. You can insert the flash drive to your computer and directly attach the file to an email. Any questions, don't hesitate to ask!

### Cooperative Observer Highlight: Mackinaw

Rick Bremner has been an official observer for the National Weather Service since June of 2000 reporting his precipitation to us every morning. He is located at Mackinaw in Tazewell County. Below is a short bio and a little bit about how he came to get involved with the National Weather Service.

*How did I become involved volunteering for the National Weather Service? I suppose it started back in the early 1970s when I got my first permanent job as a 6th grade teacher in Bloomington. One of the units I taught was electricity in its various forms. Lightning always intrigued me and as a science teacher, I delved into its mysteries. Like most amateur weather spotters, I loved driving out and watching a good storm roll in. One day on the way home from Bloomington, I spotted a funnel cloud twisting like a snake coming down halfway to the ground. I had my kids in the truck with me and because the funnel was a long distance away, I stopped on a side road to observe and got in the bed of my truck to better see the funnel. I called the local radio station to report what I was observing and they put me on the air to give a live report. After a few minutes my young son came around to the bed of the truck and informed me I was no longer on the air...in my total excitement, I had pressed the off button on my phone. When I got back in the truck I heard the on-air commentator telling us that he hoped I was okay and that the weather had not gotten me.*

*At that point I decided I needed some training in weather spotting and not long after that, I attended a workshop at our local fire department put on by the NWS. I became a SWOP volunteer after our training. A few weeks later I saw a noticed posted on the bulletin board at our local supermarket asking for COOP volunteers and the rest is history.*

(continued on page 11)

## COOP Corner *(continued)*

*In addition to being a SWOP and COOP volunteer for the weather service, I am a local ESDA volunteer storm spotting for the village of Mackinaw. Working with the National Weather Service has been an interesting, rewarding, and exciting way to give back to my country, state, and village.*

### Cooperative Observation Program Visitations:

The ongoing economic strains are impacting all of us in one way or another personally and professionally it seems these days. These pressures are forcing us here at the local NWS office to 'save and count our pennies' within various programs to ensure we are effectively using the funds that are available. Towards that end, and after review of the Cooperative Observations program, we have decided there to make some tweaks/changes to our local office communication and visitation procedures at the Cooperative Observation sites. This article defines the local changes at least for the short term within our visitations to the Cooperative Observation sites. There is an attached Appendix A which further defines the questions and inquiries specific possibly to your site and equipment.

If you have questions or concerns, please call or E-mail [Billy Ousley](#) at our office.

### Recording Rain Gauge Sites:

Units must be prepared for seasonal changes. In the fall to winterize the equipment by adding anti-freeze. In the spring to remove the anti-freeze solution from the collection bucket to avoid environmental hazards of spilling the anti-freeze on the ground. We will contact these sites regarding our plans and arrangements in meeting these needs.

### Remaining COOP Stations:

To optimize our resources, we will be using the following guidance:

**Twice a year**, we will call the observer to determine if a station visit is necessary. To find this out, we will ask the observer questions in the following general areas:

- Since the last visit, has anything changed within 200 feet of the observation equipment? Examples: new surface covering (e.g., driveway), plantings etc.
- Are there any problems with the equipment – all functioning properly, not working,
- Does the observer have any questions or problems related to the observation procedure or process?

If the answers to these questions indicate that everything is fine, then a station visit is not necessary. The station will be documented as to having completed a station visit. However, if the answers indicate that there were changes in the environment near the equipment that need to be documented or mitigated, any problems noted with equipment functionality, and/or the observer has procedural question that cannot be resolved over the phone, then a station visit should be scheduled with the observer.

If the station was not visited during the previous year, then a station visit should be scheduled.

These telephonic/communicated visits will be counted as an official station visit.

*(continued on page 11)*



## COOP Corner *(continued)*

### Examples of questions we will ask observers:

#### Rain Gage

- Condition of, or problems with, the standard or plastic gages?
- Has the exposure of the rain gage changed to adversely affect readings? (Examples: tree growth, new structures within 200 feet)

#### Temperature equipment:

- For sites with digital readouts, condition of, or problems with, Nimbus or MMTS systems. This includes both the display, and the outside "beehive" shelter (e.g. bird nests or other debris requiring the shelter be taken apart and cleaned).
- For sites with mercury/alcohol thermometers and the Cotton Region Shelter, condition or problems with the thermometers (e.g. mercury separated, broken thermometer). Sites with mercury thermometers should have a spill kit available.
- For any type of thermometer, has exposure of temperature instrument changed to adversely affect readings? (Examples: tree growth, new structures within 200 feet, new pavement nearby).

#### Soil Temperature equipment::

- Condition of, or problems with, soil temperature instrument?
- Has exposure of soil temperature instrument changed to adversely affect readings? (Examples: tree growth, new structures within 200 feet, new pavement nearby).

#### Snow Measurement equipment:

- Condition of, or problems with, snowboard, snow stick or snow stake?
- Has exposure for snow depth/water equivalency changed to adversely affect readings? (Examples: tree growth, new structures within 200 feet)

#### River gages:

- Condition or problems with use of gage? (Examples: Wire weight difficult to move, numbers faded on staff gages, vandalism at gage site, access to the gage)

## Cooperative Observer Accomplishments

The following observers will pass a monumental mark in their COOP history this fall.

#### 10 Years of Service

Mark Thompson (*Buffalo*)

#### 15 Years of Service

Effingham Water Treatment  
Plant

Fisher Water Department

#### 25 Years of Service

Warren Chamberlain (*Varna*)

#### 40 Years of Service

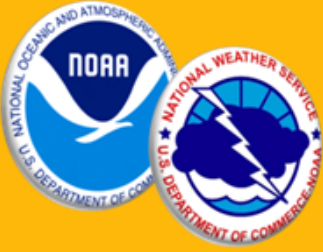
Ruth Lynn (*Clay City*)

George and Betty Becker  
(*Petersburg*)



### Reminder!

Standard Time resumes on Sunday, November 4 at 2:00 am. Be sure to set your clocks back one hour before going to bed on Saturday, November 3.



## Central Illinois Lincoln Logs

National Weather Service  
1362 State Route 10  
Lincoln, IL 62656

Phone: (217) 732-3089  
(8:30 am to 4 pm)

The *Central Illinois Lincoln Logs* is a quarterly publication of the National Weather Service office in Lincoln, Illinois. It is available on our Internet page at

[www.weather.gov/lincoln](http://www.weather.gov/lincoln)

**Newsletter Editor:**  
Chris Geelhart, Meteorologist  
[chris.geelhart@noaa.gov](mailto:chris.geelhart@noaa.gov)

## 2012-13 Winter Outlook



NOAA's annual Winter Outlook was issued on October 18. Forecasters with the Climate Prediction Center (CPC) say a wavering El Niño, expected to have developed by now, makes this year's winter outlook less certain than previous years.

"This is one of the most challenging outlooks we've produced in recent years because El Niño decided not to show up as expected," said Mike Halpert, deputy director of CPC. "In fact, it stalled out last month, leaving neutral conditions in place in the tropical Pacific."

When El Niño is present, warmer ocean water in the equatorial Pacific

shifts the patterns of tropical rainfall that in turn influence the strength and position of the jet stream and storms over the Pacific Ocean and United States. This climate pattern gives seasonal forecasters confidence in how the U.S. winter will unfold. An El Niño watch remains in effect because there's still a window for it to emerge.

Other climate factors can influence winter weather across the country. Some of these factors, such as the North Atlantic Oscillation, a prominent climate pattern, are difficult to predict more than one to two weeks in advance. The NAO adds uncertainty to the winter outlook in the Northeast and Mid-Atlantic portions of the country.

Areas ravaged by extreme drought over the past year are unlikely to see much relief from drought conditions this winter.

In the 2012 U.S. Winter Outlook (December through February) odds favor:

- Warmer-than-average temperatures in much of Texas, northward through the Central and Northern Plains and westward across the Southwest, the Northern Rockies, and eastern Washington, Oregon and California, as well as the northern two-thirds of Alaska.
- Cooler-than-average temperatures in Hawaii and in most of Florida, excluding the panhandle.
- Drier-than-average conditions in Hawaii, the Pacific Northwest and Northern California, including Idaho, western Montana, and portions of Wyoming, Utah and most of Nevada.
- Drier-than-average conditions in the upper Midwest, including Minnesota, Wisconsin, Iowa and northern Missouri and eastern parts of North and South Dakota, Nebraska, Kansas, and western Illinois.
- Wetter-than-average conditions across the Gulf Coast states from the northern half of Florida to eastern Texas.

This seasonal outlook does not project where and when snowstorms may hit or provide total seasonal snowfall accumulations. Snow forecasts are dependent upon the strength and track of winter storms, which are generally not predictable more than a week in advance.

